

2006	Heteropterus Revista de Entomología Heteropterus Rev. Entomol.	6: 67-74
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ISSN: 1579-0681

Orthotylus (Pachylops) jordii sp. nov. (Hemiptera: Heteroptera: Miridae) from the Basque Country, northern Iberian Peninsula

S. PAGOLA-CARTE¹, I. ZABALEGUI²

¹Azpeitia 3, 7. D; E-20010 Donostia (Gipuzkoa); E-mail: pagolaxpc@telefonica.net

²Zikuñaga 44, 4^o A; E-20120 Hernani (Gipuzkoa); E-mail: zabaloyar@terra.es

Abstract

Orthotylus (Pachylops) jordii sp. nov. is described from the northern Iberian Peninsula on material from the Basque Country (provinces of Araba and Nafarroa). Belonging to the *virescens*-group of species, it can be separated from the related taxa *genisticola*, *major* and *virescens* on the basis of several diagnostic characters concerning external morphology (body size, ocular index and metatibia length, among others) as well as male and female genitalia. In addition, biological (host plant: *Genista scorpius* (L.) DC.) and chorological data are of great interest in the discussion.

Key words: *Orthotylus (Pachylops) jordii* sp. nov., Orthotylineae, Miridae, Heteroptera, Basque Country, northern Iberian Peninsula.

Resumen

***Orthotylus (Pachylops) jordii* sp. nov. (Hemiptera: Heteroptera: Miridae) del País Vasco, norte de la Península Ibérica**

Se describe *Orthotylus (Pachylops) jordii* sp. nov. del norte de la Península Ibérica, con base en ejemplares del País Vasco (provincias de Araba y Nafarroa). Perteneciente al grupo de especies de *virescens*, puede ser separada de los taxones próximos *genisticola*, *major* y *virescens* por diversos caracteres diagnósticos relativos a la morfología externa (tamaño corporal, índice ocular y longitud de la metatibia, entre otros) así como por las genitalias masculina y femenina. Asimismo, resultan de gran interés para la discusión los datos biológicos (planta huésped: *Genista scorpius* (L.) DC.) y corológicos.

Palabras clave: *Orthotylus (Pachylops) jordii* sp. nov., Orthotylineae, Miridae, Heteroptera, País Vasco, norte de la Península Ibérica.

Laburpena

***Orthotylus (Pachylops) jordii* sp. nov. (Hemiptera: Heteroptera: Miridae), Euskal Herrikoa, Iberiar Penintsularen iparraldean**

Orthotylus (Pachylops) jordii sp. nov. deskribatzen da Iberiar Penintsularen iparraldean, Euskal Herriko (Arabako eta Nafarroako lurraldeetako) aleetan oinarriturik. Generoko *virescens*-taldean sailkatzen delarik, *genisticola*, *major* eta *virescens* espezie hurbiletatik bereiz daiteke zenbait ezaugarri diagnostiko direla eta, bai kanpo-morfologiakoak (tamaina, begi-indizea eta metatibiaren luzera, besteak beste) bai eta arren zein emeen genitaliakoak ere. Horretaz gain, datu biologikoak (landare ostalaria: *Genista scorpius* (L.) DC.) eta korologikoak interes handiko suertatzen dira eztabaidan.

Gako-hitzak: *Orthotylus (Pachylops) jordii* sp. nov., Orthotylineae, Miridae, Heteroptera, Euskal Herria, Iberiar Penintsularen iparraldea.

Introduction

The widely distributed and most likely non-monophyletic genus *Orthotylus* Fieber, 1858 is one of the most diverse among Miridae (Schuh, 1995). Only in the Palearctic Region more than 120 species are known, which are grouped in nine subgenera (Kerzhner and Josifov, 1999). Ehanho and Matocq (1990) provided a key for the seven European subgenera, mainly based on the dorsal vestiture and male genitalia. Concerning the Iberian fauna, 43 species belonging to six of those subgenera have been recorded up to present (Gessé and Goula, 2004; Pagola-Carte and J. Ribes, in press). As far as known, before the present contribution the subgenus *Pachylops* Fieber, 1858 consisted of 16 Palearctic species (Kerzhner and Josifov, 1999), with its highest diversity around the Mediterranean basin and the species *O. (P.) virescens* (Douglas & Scott, 1865) having been introduced in North America (Wheeler and Henry, 1992).

The complex nomenclatorial history of *Pachylops* Fieber, 1858 was set out in detail by Carapezza (1997), who proposed, among other changes, the synonymy of *Orthotylus (Neopachylops)* Wagner, 1956 with it, and described *Orthotylus (Pachylops) genisticola* from Tunisia.

When studying the orthotyline material found over the last years in the Basque Country, we have detected, among several *Platycranus (Genistocapsus)* spp., some small to medium sized specimens of *O. (Pachylops)* collected on *Genista scorpius* (L.) DC. They belong to a new species, which is described below and compared with the related taxa of the subgenus.

The studied area is the Iberian Basque Country, *i.e.* the Spanish administrative regions named Basque Autonomous Community (including the provinces of Araba, Bizkaia and Gipuzkoa) and Foral Community of Navarre (province of Nafarroa).

Results

Orthotylus (Pachylops) jordii sp. nov.

Type material:

Holotype: ♂, mounted on card, labelled: «Villamanca-Marinda / 625 m; *Genista scorpius* / Kuartango / ARABA 30TWN0447 / 17-06-2005 / S. Pagola Carte leg.» (white label); «HOLOTYPE / *Orthotylus (Pachylops) jordii* sp. nov. /

Pagola-Carte & Zabalegui» (red label). Deposited in the Museu de Ciències Naturals, Barcelona.

Paratypes: 18 ♂♂, 33 ♀♀, mounted on card, and with white labels as follows: 2 ♂♂, 2 ♀♀: «Arratu (Korres) / 750 m; *Genista scorpius* / Arraia-Maeztu / ARABA 30TWN4529 / 7-07-2003 / S. Pagola Carte leg.»; 7 ♀♀: «Igari-Bidankoze / 780 m; *Genista scorpius* / Bidankoze / NAFARROA 30TXN64 / 12-07-2003 / S. Pagola Carte leg.»; 2 ♀♀: «Garde-Ansó (Mata-machos) / 840 m; *Genista scorpius* / Garde / NAFARROA 30TXN73 / 18-07-2003 / S. Pagola Carte leg.»; 3 ♀♀: «Biloria / 800 m; *Genista scorpius* / Erriberagoitia / ARABA 30TWN03 / 23-07-2004 / S. Pagola Carte leg.»; 4 ♂♂, 4 ♀♀: «Buradon Gatzaga / 530 m; *Genista scorpius* / Bastida / ARABA 30TWN1320 / 10-06-2005 / S. Pagola Carte leg.»; 4 ♂♂, 3 ♀♀: «Villamanca-Marinda / 625 m; *Genista scorpius* / Kuartango / ARABA 30TWN0447 / 17-06-2005 / S. Pagola Carte leg.»; 7 ♂♂, 3 ♀♀: «Las Campas de Gabo (Nandares) / 605 m; *Genista scorpius* / Iruña Oka / ARABA 30TWN1541 / 17-06-2005 / S. Pagola Carte leg.»; 1 ♂, 2 ♀♀: «Lalastra-Ribera / 910 m; *Genista scorpius* / Gobiaran (Valderejo Parke Naturala) / ARABA 30TVN8146 / 5-07-2005 / S. Pagola Carte leg.»; 3 ♀♀: «La Tejera mendatea / 750 m; *Genista scorpius* / Erriberagoitia / ARABA 30TWN0338 / 12-07-2005 / S. Pagola Carte leg.»; 4 ♀♀: «Ribera / 750-800 m; *Genista scorpius* / Gobiaran (Valderejo Parke Naturala) / ARABA 30TVN8144 / 12-07-2005 / S. Pagola Carte leg.».

All the paratypes also labelled: «PARATYPE / *Orthotylus (Pachylops) jordii* sp. nov. / Pagola-Carte & Zabalegui» (red label).

Paratypes deposited: 2 ♂♂, 2 ♀♀, in the Museu de Ciències Naturals, Barcelona; 1 ♂, 1 ♀, in the Museo Nacional de Ciencias Naturales, Madrid; 15 ♂♂, 30 ♀♀, in the Pagola-Zabalegui collection, Donostia.

In addition to the type material, further specimens have been recorded in «Sierra de Arkamo / 780 m / Artaza / ARABA 30TWN04 / 25-06-2005 / I. Zabalegui leg.» and «Sierra Brava de Badaya / 700 m / Kuartango / ARABA 30TWN14 / 21-06-2005 / I. Zabalegui leg.».

Type locality:

Kuartango (near the small villages of Villamanca and Marinda); province of Araba; Basque Country; northern Iberian Peninsula.

Description:

Coloration (Figs. 1a-b): Green, shining, turning to yellowish in dry specimens, particularly so by regions of the head, pronotum and the whole basis of the scutellum. Antennae yellowish with minute black hairs; 1st article slightly tinged with green, specially in females; 3rd and 4th articles enbrowned. Last joint of rostrum blackish in its apical half. Femora mostly green, turning to yellowish in dry specimens. Tibiae mostly yellow, tinged with green; tibial spines black. Tarsi mostly pale, with the apical half of the 3rd tar-

	<i>O. (P.) jordii</i> sp. nov.		<i>O. (P.) virescens</i> (Douglas & Scott, 1865)	
	♂♂	♀♀	♂♂	♀♀
Total length (mm)	3.94 (3.70 – 4.12)	3.37 (2.97 – 3.58)	4.40 (4.09 – 4.70)	4.26 (4.00 – 4.55)
Article I of antennae (mm)	0.28 (0.27 – 0.30)	0.26 (0.24 – 0.29)	0.35 (0.33 – 0.38)	0.34 (0.33 – 0.36)
Article II of antennae (mm)	1.11 (1.02 – 1.20)	0.95 (0.84 – 1.02)	1.42 (1.29 – 1.53)	1.31 (1.17 – 1.38)
Article III of antennae (mm)	0.92 (0.81 – 1.02)	0.74 (0.66 – 0.84)	1.29 (1.20 – 1.35)	1.09 (1.02 – 1.14)
Article IV of antennae (mm)	0.34 (0.33 – 0.36)	0.34 (0.30 – 0.39)	0.45 (0.42 – 0.48)	0.45 (0.39 – 0.51)
Ocular index	1.59 (1.43 – 1.68)	2.30 (2.00 – 2.60)	1.45 (1.25 – 1.57)	2.18 (1.85 – 2.55)
Pronotum width / length	2.26 (2.15 – 2.33)	2.36 (2.17 – 2.50)	2.09 (2.00 – 2.23)	2.17 (2.00 – 2.38)
Total length / Pronotum width	3.80 (3.69 – 3.91)	3.17 (2.97 – 3.42)	3.92 (3.55 – 4.14)	3.67 (3.45 – 3.83)
Head / Pronotum (widths)	0.68 (0.66 – 0.71)	0.68 (0.62 – 0.71)	0.68 (0.65 – 0.71)	0.67 (0.65 – 0.69)
Article II of antennae / Pronotum width	1.08 (1.00 – 1.14)	0.91 (0.78 – 1.00)	1.28 (1.13 – 1.42)	1.14 (1.05 – 1.28)
Article III / Article II of antennae	0.83 (0.77 – 0.91)	0.78 (0.65 – 0.82)	0.91 (0.86 – 0.96)	0.83 (0.79 – 0.90)
Metatibia / Tarsus (lengths)	3.54 (3.38 – 3.67)	3.33 (3.06 – 3.77)	3.75 (3.50 – 3.85)	3.58 (3.32 – 3.84)
Metatibia length / Pronotum width	1.62 (1.57 – 1.71)	1.40 (1.32 – 1.55)	1.97 (1.82 – 2.14)	1.80 (1.70 – 1.94)
Metatibia length / Total length	0.43 (0.42 – 0.45)	0.44 (0.42 – 0.48)	0.50 (0.47 – 0.53)	0.49 (0.47 – 0.51)

TABLE 1. Biometric comparison between *Orbotylus (Pachylops) jordii* sp. nov. and *Orbotylus (Pachylops) virescens* (Douglas & Scott, 1865). Average values and ranges of variability are given for the Basque specimens studied. All measurements are based on a minimum of 10 specimens of each sex. The most outstanding distinguishing features are indicated in bold.

somere brown. Membrane uniformly grey, not very dark, with grey-yellowish veins.

Dorsal vestiture consisting of semierect black hairs and shining, pale scalelike setae; the latter ones less abundant or more easily lost. First joint of antennae with 2–4 long black bristles on its inner surface.

Morphometry (see Table 1 also including average values): Body length: 3.70–4.12 mm (♂♂); 2.97–3.58 mm (♀♀). Body elongate, 3.69–3.91 (♂♂) and 2.97–3.42 (♀♀) times longer than basal width of pronotum. Head about 0.68 times (♂♂ and ♀♀) as broad as pronotum. Posterior margin of vertex slightly raised. Ocular index 1.43–1.68 (♂♂) and 2.00–2.60 (♀♀). Rostrum extending a little beyond procoxae, with the last two articles slightly swollen. Length of antennal joints (averages): 0.28–1.11–0.92–0.34 mm (♂♂) and 0.26–0.95–0.74–0.34 mm (♀♀); 2nd joint 1.00–1.14 (♂♂) and 0.78–1.00 (♀♀) times longer than basal width of pronotum; 3rd joint 0.77–0.91 (♂♂) and 0.65–0.82 (♀♀) times as long as 2nd one. Pronotum 2.15–2.33 (♂♂) and 2.17–2.50 (♀♀) times as broad as centrally long. Hemelytra distinctly longer than abdomen in both sexes. Metatibia 3.38–3.67 (♂♂) and 3.06–3.77 (♀♀) longer than tarsus (including ongles), 1.57–1.71 (♂♂) and 1.32–1.55 (♀♀) as broad as basal width of pronotum, and 0.42–0.45 (♂♂) and 0.42–0.48 (♀♀) as long as total length of the insect.

Male genitalia (Figs. 2 and 3a): right paramere (Fig. 2a) short and broad, with two horn-like apical processes;

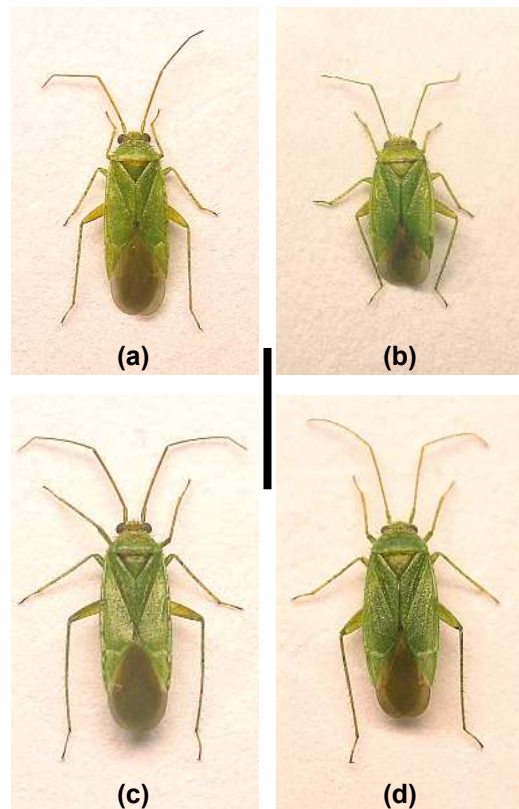


FIGURE 1. Habitus of: (a) ♂ (from Iruña Oka, Araba) and (b) ♀ (from Bidankoze, Nafarroa) of *Orbotylus (Pachylops) jordii* sp. nov.; and (c) ♂ (from Bergara, Gipuzkoa) and (d) ♀ (from Errigoiti, Bizkaia) of *Orbotylus (Pachylops) virescens* (Douglas & Scott, 1865) (Scale bar = 3 mm).

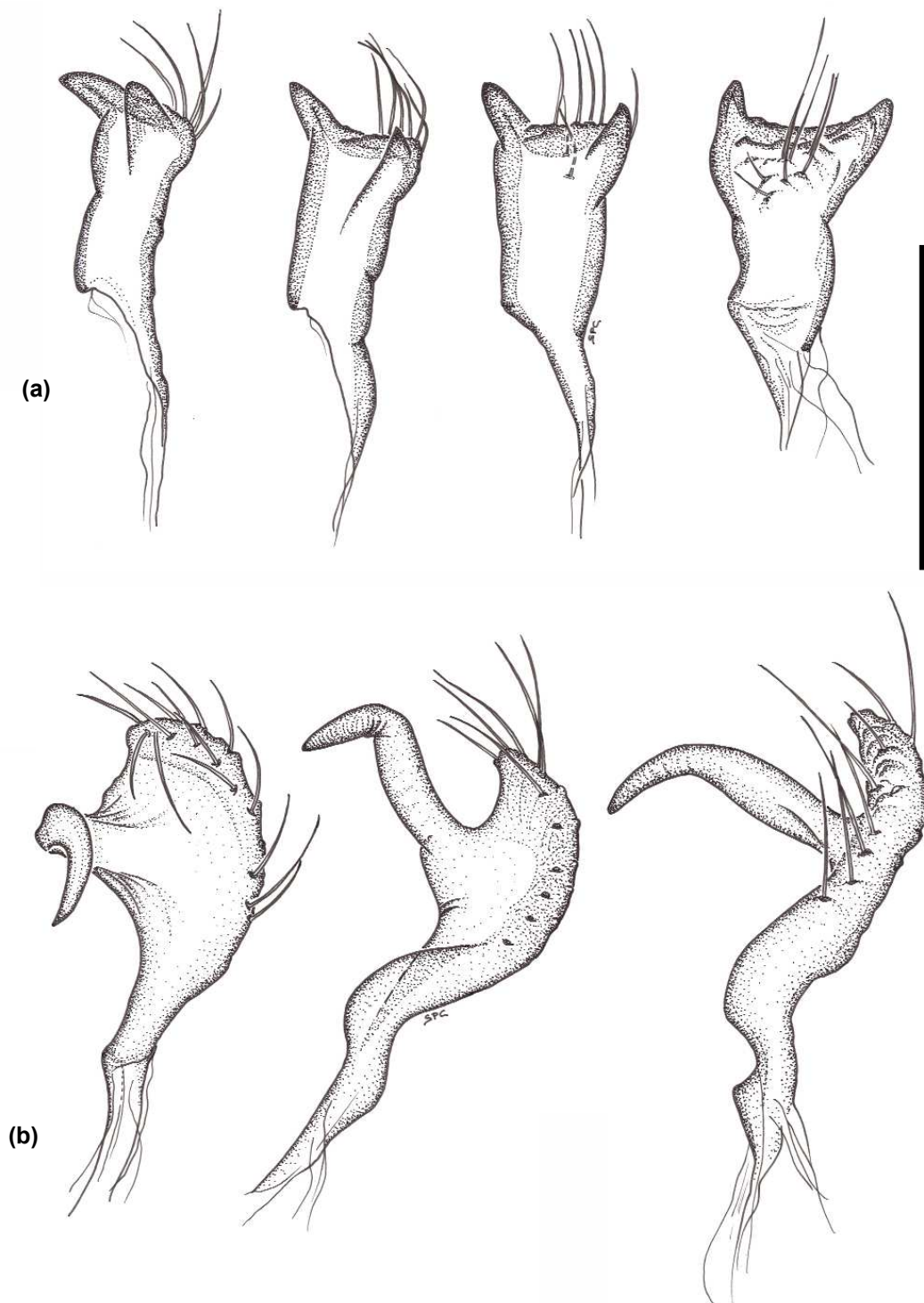


FIGURE 2. Male genitalia of *Orthotylus (Pachylops) jordii* sp. nov.: (a) right paramere, different views and/or specimens; (b) left paramere, different views and/or specimens (Scale bar = 0.2 mm).

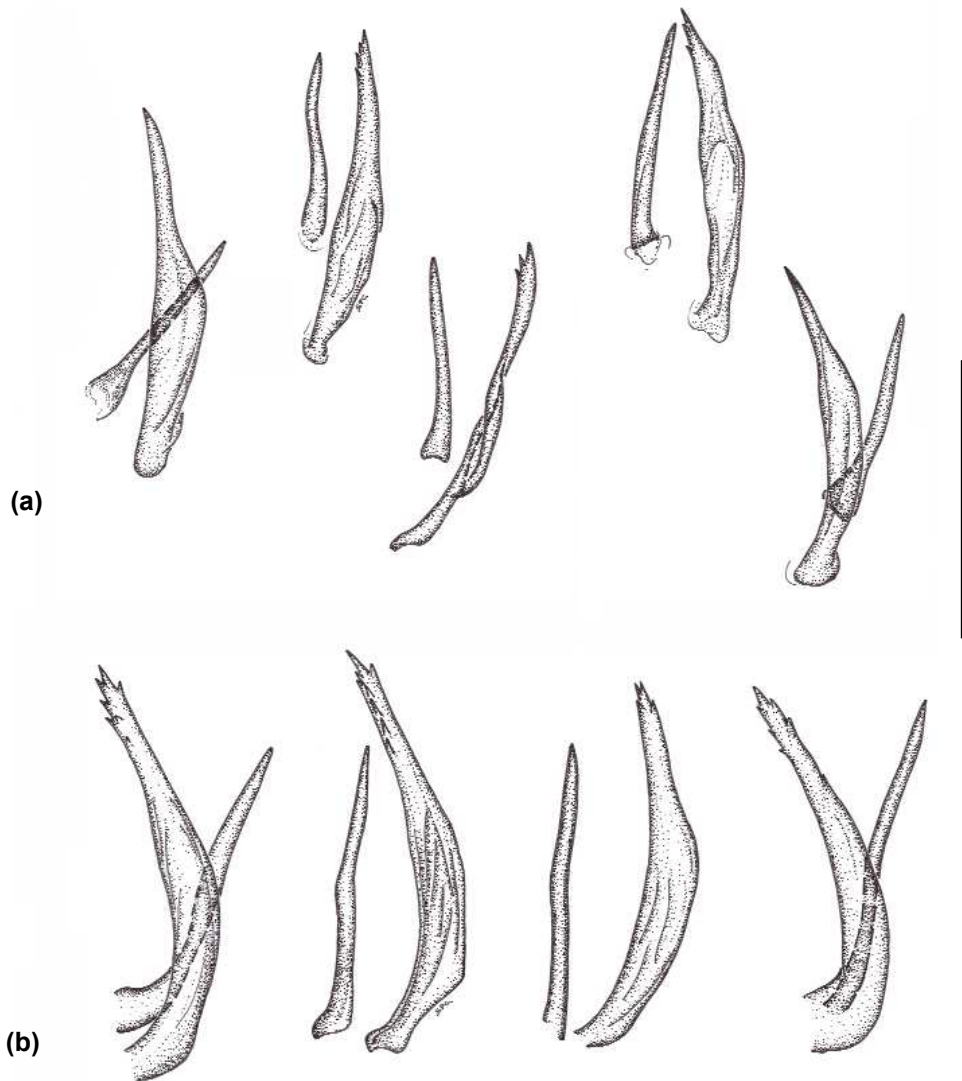


FIGURE 3. (a) Sclerotized processes of the vesica (male genitalia) of *Orthotylus (Pachylops) jordii* sp. nov.: different views and/or specimens; (b) the same in *Orthotylus (P.) virescens* (Douglas & Scott, 1865) (Scale bar = 0.2 mm).

left paramere (Fig. 2b) bifurcate, with sensory lobe and shaft forming two diverging arms; sclerotized processes of the vesica as in Fig. 3a (some comparative remarks in the Discussion section).

Female genitalia (Figs. 4a-e): the K structure of the gynatrial complex is shown for several specimens (some comparative remarks in the Discussion section).

Etymology:

From the first name of our friend, colleague, and great heteropterist Jordi Ribes (Barcelona, Catalonia), who is very kindly showing us into the exciting world of true bugs.

The subgenus *Pachylops* of *Orthotylus* is now fortunate to accommodate, in his honour, both the species *ribesi* Wagner, 1976 and *jordii* sp. nov.

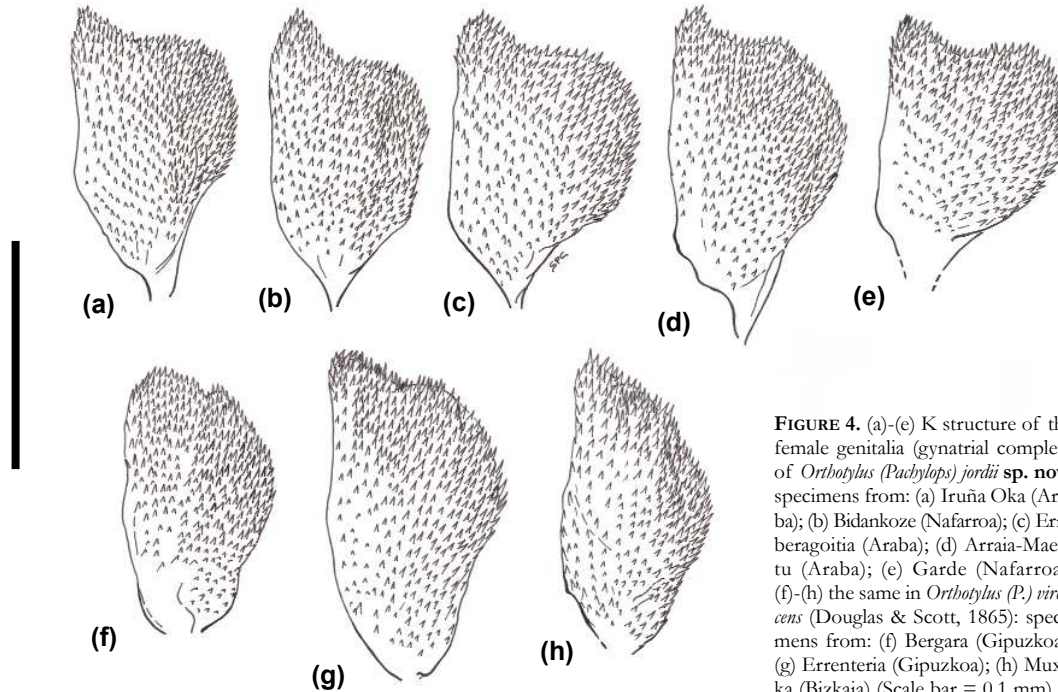


FIGURE 4. (a)-(e) K structure of the female genitalia (gynatrial complex) of *Orthotylus (Pachylops) jordii* sp. nov.: specimens from: (a) Iruña Oka (Araba); (b) Bidankoze (Nafarroa); (c) Erriberagoitia (Araba); (d) Arraia-Maeztu (Araba); (e) Garde (Nafarroa); (f)-(h) the same in *Orthotylus (P.) virescens* (Douglas & Scott, 1865): specimens from: (f) Bergara (Gipuzkoa); (g) Errenteria (Gipuzkoa); (h) Muxika (Bizkaia) (Scale bar = 0.1 mm).

Biology and distribution:

Collected always on *Genista scorpius* (L.) DC. (Fabaceae) between middle June and middle July, where it may occur together with the Miridae *Deraeocoris (D.) cordiger* (Hahn, 1834), *Heterocordylus (H.) tibialis* (Hahn, 1833), *Halticus pusillus* (Herrich-Schaeffer, 1835), *Orthotylus (O.) verticatus* Wagner, 1958, and *Platycranus (Genistocapsus) minutus* Wagner, 1955. The latter two species usually form, together with *O. (P.) jordii* sp. nov., a «cloud of green mirids» difficult to separate in the field.

As far as known, its distribution along the Basque Country would fit that of the host plant (Aizpuru *et al.*, 1990) (Fig. 5). On the other hand, the distribution of the related taxon *Orthotylus (Pachylops) virescens* (Douglas & Scott, 1865) in the area studied seems to be strongly linked to the chorology of the genus *Cytisus*, since it has been always observed on *C. scoparius* (L.) Link and on the Cantabrian endemism *C. commutatus* (Willk.) Briq. (Biurrun Aramayo and Herrera Mesa, 1985; Pagola-Carte *et al.*, 2005; several inedit records).

Interestingly, both *Orthotylus* species have been found in one of the overlapping areas for those Fabaceae in the province of Araba. Even there, and separated by a few metres, *O. (P.) virescens* (Douglas & Scott, 1865) strictly lives on *Cytisus scoparius* and *O. (P.) jordii* sp. nov. on *Genista scorpius*, having not been recorded intermediate morphological forms.

The new taxon is likely to be present as well in the surrounding areas of the northern Iberian Peninsula (Aragon, Castile, La Rioja).

Discussion

O. (P.) jordii sp. nov. shares with *O. (P.) virescens* (Douglas & Scott, 1865) the small length of the rostrum and the shape of parameres (Wagner, 1974). Its smaller size gets it closer to *O. (P.) griseinervis* Wagner, 1961, recently synonymized with *O. (P.) virescens* (Douglas & Scott, 1865) (Carapezza and J. Ribes, 2004). At first glance, it could be thought that our speci-

mens are within the margins of variability of *O. (P.) virescens* (Douglas & Scott, 1865), which were briefly commented by those authors when establishing the mentioned synonymy. Nevertheless, the study of abundant material of both species has confirmed that there exist constant differences between them. Specifically, in *O. (P.) jordii* **sp. nov.**:

- Coloration (see Fig. 1): The general green colour is lighter. The darkened portion of the tarsi is always restricted to the apical half of the 3rd tarsomeres (in *O. (P.) virescens* (Douglas & Scott, 1865) it is generally more extended, sometimes to the whole tarsi). The membrane is much paler, not producing, as in *O. (P.) virescens* (Douglas & Scott, 1865), a marked contrast to the bright green of the coria.
- Morphometry: A comparative summary is provided in Table 1. Besides its smaller size, the most outstanding differences concern the ratio «total length/pronotum width» for females (hence, females are less elongated), the ratio «article II of antennae/pronotum width», which is slightly but significantly smaller, and the length of metatibia, which is distinctly shorter, as clearly revealed by the last two ratios in Table 1. In addition, pronotal calli are more conspicuous than in *O. (P.) virescens* (Douglas & Scott, 1865), as are other pronotal traits such as the sinuosities of the margins.
- Male genitalia: Like in *O. (P.) virescens* (Douglas & Scott, 1865), it is characterized by the presence of two elongate vesical processes: one is smaller, thinner, lanceolate and with smooth margins; the other is bigger, curvate and apically serrated. However, in *O. (P.) jordii* **sp. nov.** (Fig. 3a) the bigger process is not clearly serrated on both sides, and the smaller process is only about 0.6 times as long as the bigger one (about 0.8 times in *O. (P.) virescens* (Douglas & Scott, 1865): Fig. 3b).
- Female genitalia: The outer lobe of the K structure is more swollen or convex and the inner one is more distinctly pointed (Figs. 4a-e). In *O. (P.) virescens* (Douglas & Scott, 1865), the K structure shows a more elongate shape and its outer lobe is more flattened (Figs. 4f-h).

The new species is also close to the Maghrebin species *O. (P.) genisticola* Carapezza, 1997 and *O. (P.) major* (Wagner, 1969). Besides some differences in their male genitalia (see Carapezza's (1997) illustrations), *O. (P.) jordii* **sp. nov.** is easily distinguished, from the former by its greater size (*genisticola*: ♂♂: 3.2–3.5 mm)

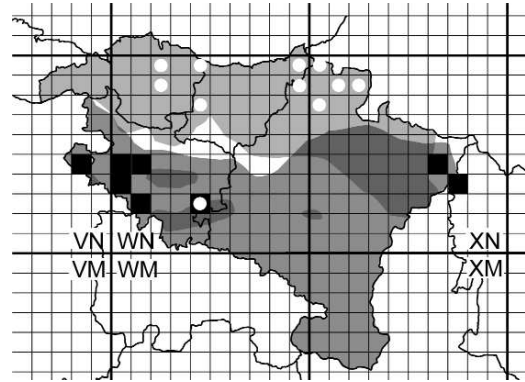


FIGURE 5. Records of *Orthotylus (Pachylops) virescens* (Douglas & Scott, 1865) (white circles) and *Orthotylus (Pachylops) jordii* **sp. nov.** (black squares) superimposed to the known distributions of their host plants in the Iberian Basque Country: *Cytisus* spp. (pale grey, to the north) and *Genista scorpius* (L.) DC. (dark grey, to the south), respectively. Much darker patches denote overlapping areas between both plant distributions. Sources of the data are indicated in the text. UTM coordinates (10 x 10 km) are shown in the map.

and its smaller ocular index (*genisticola*: ♂♂: 2.0–2.1); from the latter, by its smaller size (*major*: ♂♂: 4.2–4.6 mm; ♀♀: 4.0–4.6 mm) and its greater ocular index (*major*: ♂♂: 1.25–1.35; ♀♀: 2.0–2.1) (Wagner, 1969, 1974; Carapezza, 1997).

Undoubtedly, *genisticola*, *major*, *virescens*, and now *jordii*, form a closely related group of species within the subgenus *Pachylops*, as suggested by the male genitalic structures. A plausible evolutionary scenario should connect the adaptation to living on *Genista* spp. («meridional» species: *genisticola*, *major* and *jordii*) with a number of speciations from a big-sized European ancestor living on *Cytisus* spp., such as *virescens*. Some of those speciations would have been accompanied by a general trend of size reduction, giving rise to the present picture: *O. (P.) virescens* (Douglas & Scott, 1865) coexisting with *O. (P.) genisticola* Carapezza, 1997 and *O. (P.) major* (Wagner, 1969) in northern Africa and with *O. (P.) jordii* **sp. nov.** in the northern Iberian Peninsula. It is obvious that, in addition to the morphological differences exhibited by *O. (P.) jordii* **sp. nov.**, biological data are also of particular interest in this framework.

Acknowledgements

We are deeply grateful to two anonymous referees. We are also indebted to M. A. Alonso-Zarazaga for nomenclatorial advice. Some of the samplings were conducted as part of two projects founded by the Biodiversity Service of the Basque Government.

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Received / Recibido / Hartua: 27/08/2006

Accepted / Aceptado / Onartua: 4/10/2006

Published / Publicado / Argitaratua: 31/12/2006